The Colorado Floods

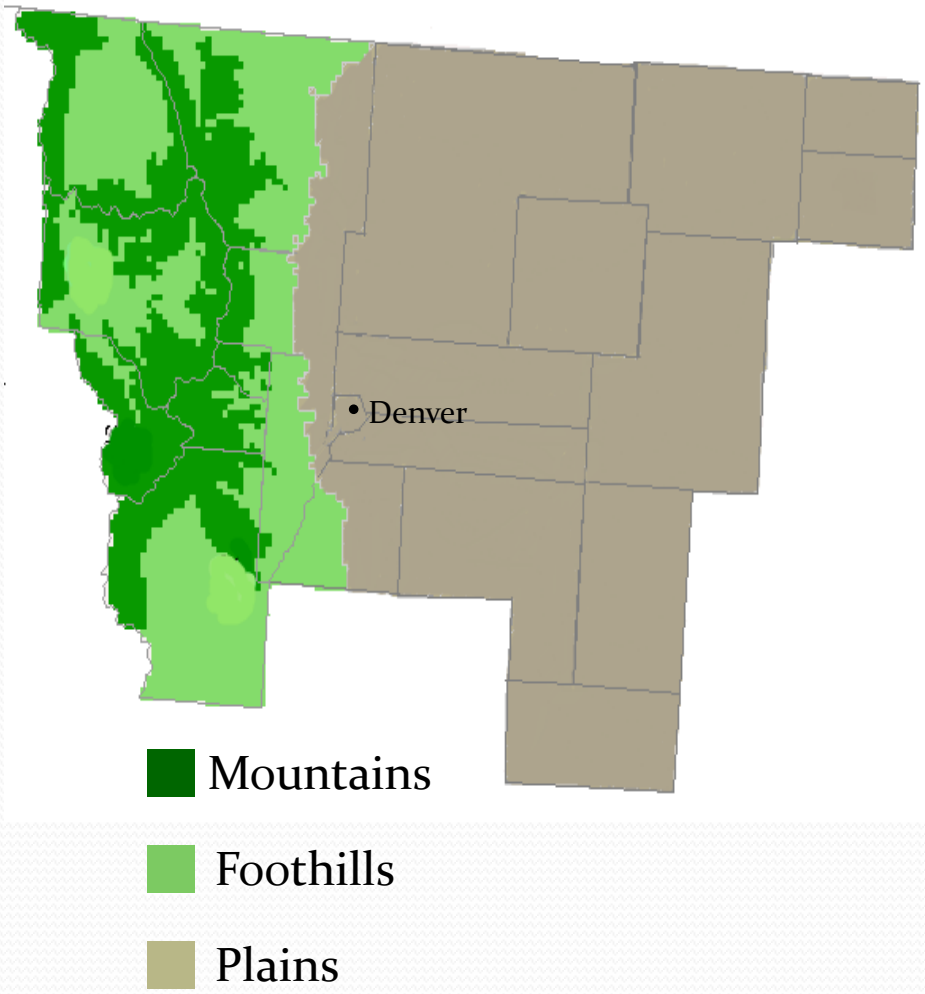
The Storms of June 14-20, 1965

NWS Denver/Boulder

Jesse Smith

Climate of the Region

- The mountain region usually receives about 50 inches of precipitation annually
- The lower foothills receive 14-20 inches
- The eastern plains are accustomed to light rainfall, around 15 inches of precipitation annually.



Antecedent Rainfall

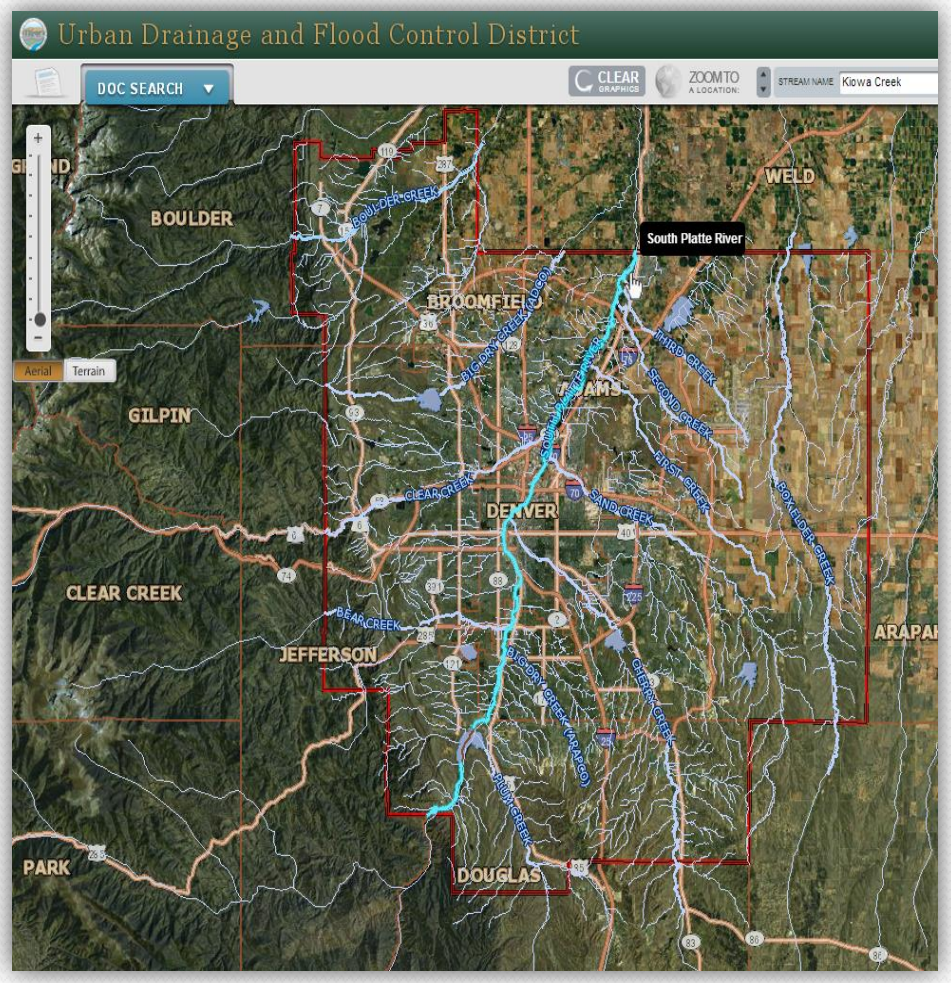
- From May 21 to June 3, light rains were consistent over the entire region (some locations recorded over an inch!).
- On June 4 & 5, heavier rains occurred; 2 inches reported in some locations).
- Over the remainder of the month, the region witnessed lighter rain up to the arrival of the storm June 14.

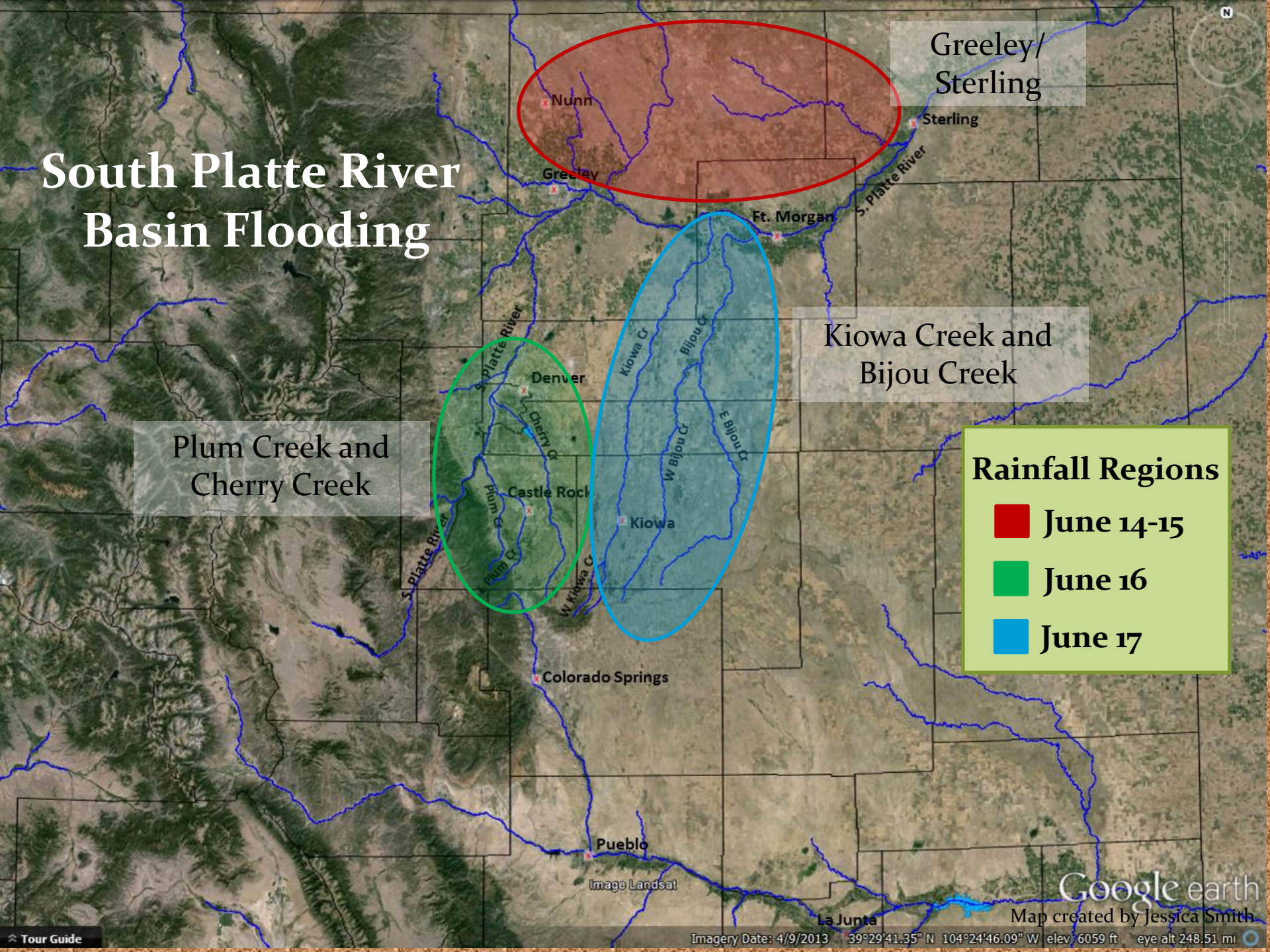


Flooding Locations

South Platte Basin

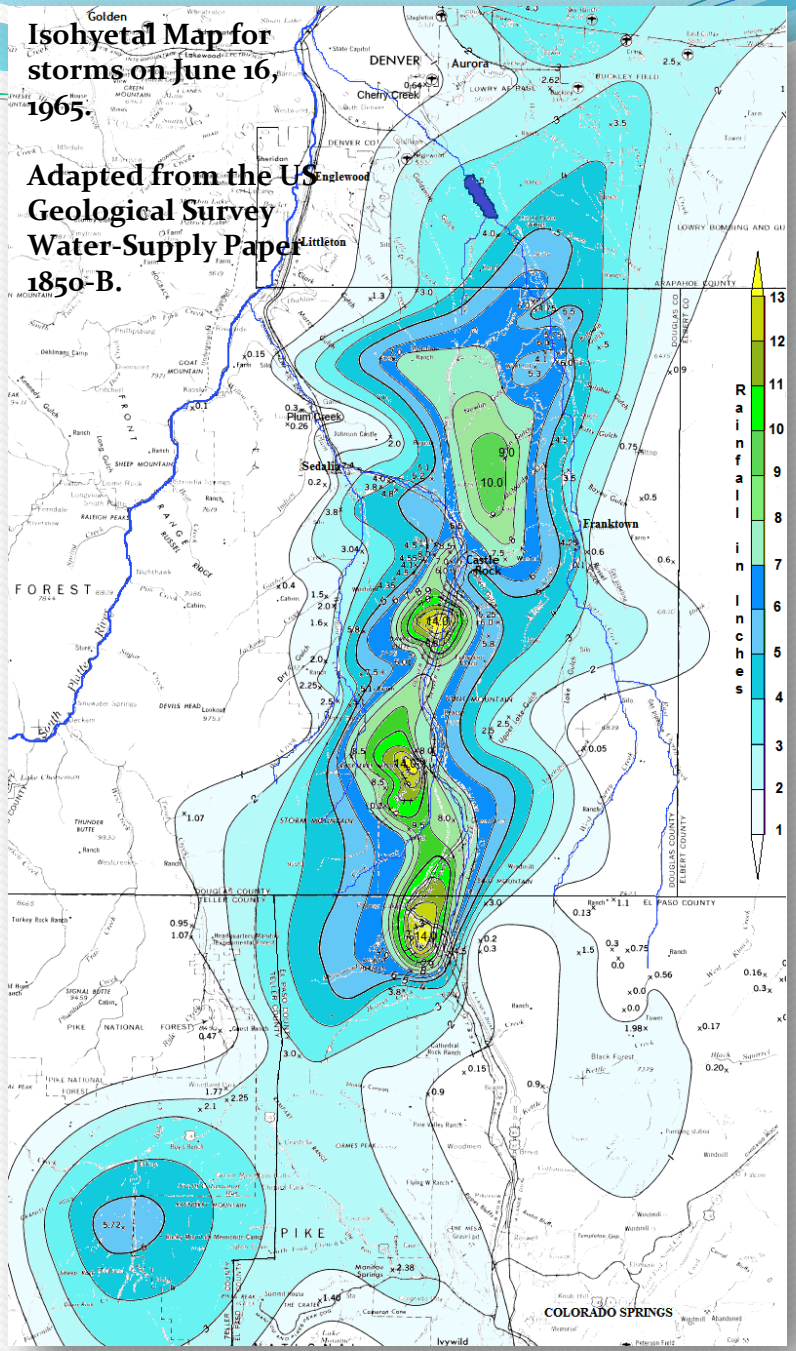
- Flooding occurred in 4 main regions:
  - North of Greeley and north/west of Sterling
  - Plum Creek and Cherry Creek basins
  - Kiowa Creek and Bijou Creek basins
  - South Platte River from Plum Creek to Nebraska




South Platte River Basin Flooding
Greeley/ Sterling
Kiowa Creek and Bijou Creek
Plum Creek and Cherry Creek
Rainfall Regions
June 14-15
June 16
June 17
Nunn
Sterling
Greeley
Ft. Morgan
S. Platte River
Denver
Cherry Cr
Castle Rock
Plum Cr
E Plum Cr
S Platte River
W Kiowa Cr
Kiowa Cr
Bijou Cr
W Bijou Cr
E Bijou Cr
Kiowa
Colorado Springs
Pueblo
La Junta
Image Landsat
Google earth
Map created by Jessica Smith
Tour Guide
Imagery Date: 4/9/2013 39°29'41.35" N 104°24'46.09" W elev 6059 ft eye alt 248.51 mi

Rainfall Observations

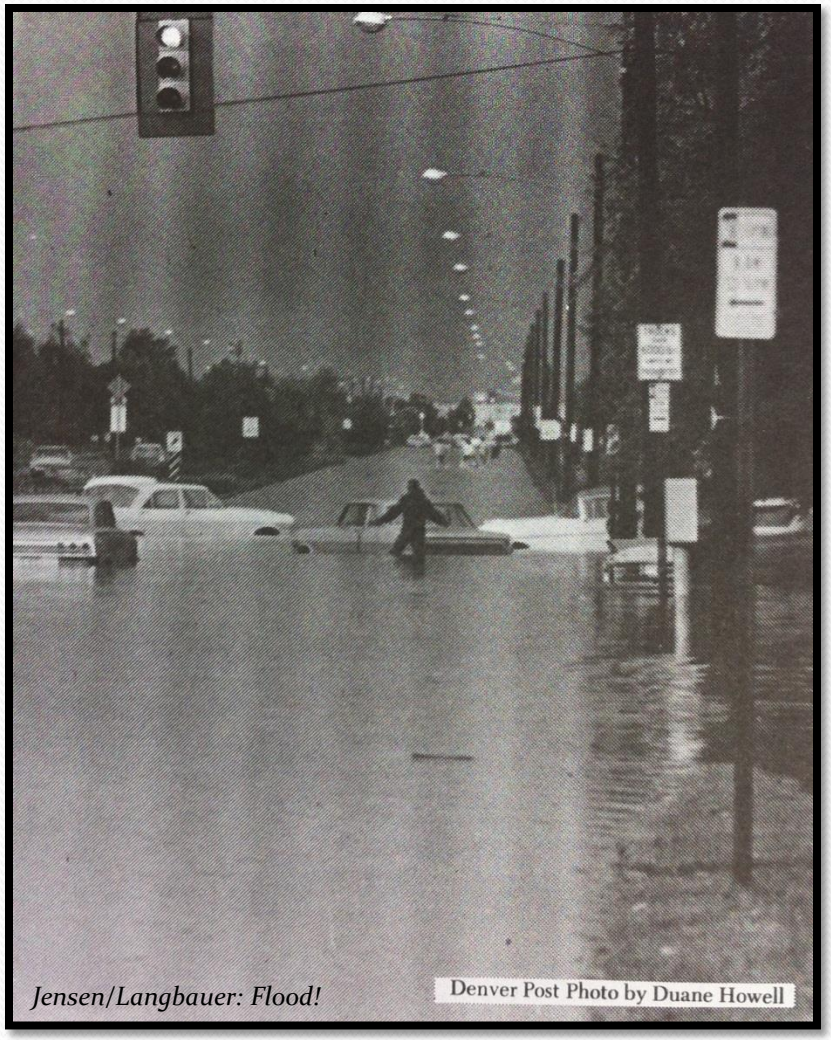
- 6/15 Elbert County: 6” in 30 minutes
- 6/16 Larkspur & Castle Rock: 14” in 4 hours
- 6/16 Douglas County south of Castle Rock: 14” in 4 hours
- 6/17 Holly: 11.08” in 6 hours



From UCAR Assessment

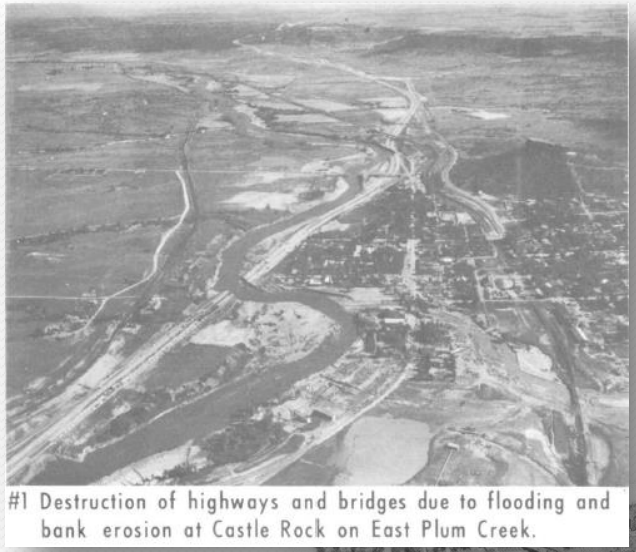
Greeley/Sterling
June 14-15

- Storms formed south of the Colorado/Wyoming state line.
- These areas witnessed heavy rain and hail.
- A cold front formed, and became stationary on the 15th.



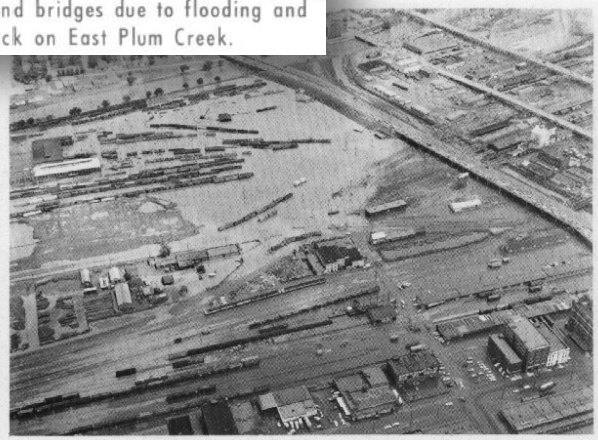
Plum Creek & Cherry Creek

June 16



#1 Destruction of highways and bridges due to flooding and bank erosion at Castle Rock on East Plum Creek.

U.S. Corps of Engineers



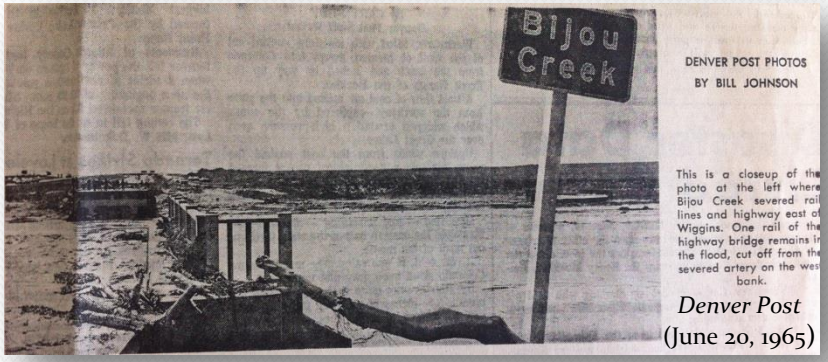
(19) From high above the lower downtown area, the confluence of Cherry Creek and the South Platte River is seen at the top of the photo. The eastern edge of the inundated area runs through the buildings at the bottom of the picture. The 14th, 15th and 16th Street Viaducts run across the upper right

Hotchkiss/*Trajectory of a Tragedy*

- Storms were centered over Plum & Cherry Creek
- Stationary because of a lack of a westerly wind
- Main floodwaters that came through Denver originated in Plum Creek
- Water from Cherry Creek was stored in the Cherry Creek Reservoir

Kiowa Creek & Bijou Creek

June 17



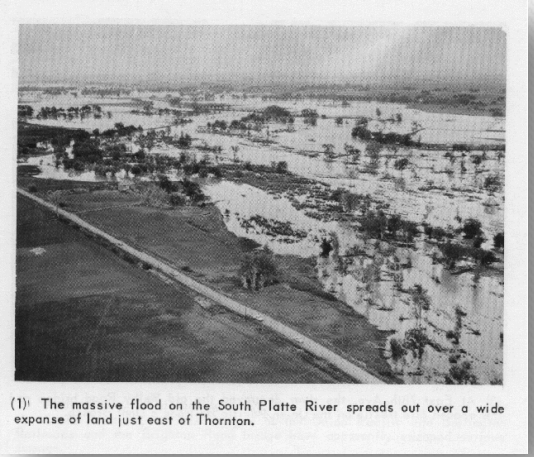
Denver Post
(June 20, 1965)

U.S. Corps of Engineers

- Flood levels were moderate to high on June 15, but surged to extremely high on the 17th.
- The Palmer Ridge enhanced convection over the area south and east of Denver.
- These storms moved north, following the flow of the creeks.

South Platte River Flood

- The flood from Plum Creek reached metro Denver overnight on the 16th.
- Witnesses reported a wall of water 20' tall travelling down the banks of the South Platte.
- At some points, the river was ½ mile wide.



(1) The massive flood on the South Platte River spreads out over a wide expanse of land just east of Thornton.

Hotchkiss/*Trajectory of a Tragedy*

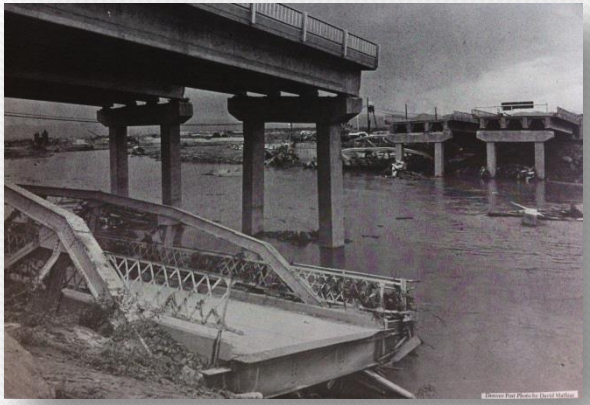
Englewood Public Library

#17 Aerial view showing receding flood waters of the South Platte River at the south edge of Denver.

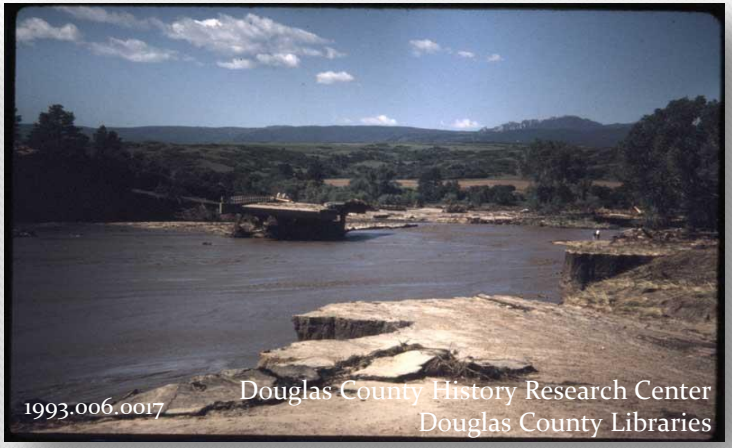
U.S. Corps of Engineers

Bridges Swept Away

- Nearly all east/west bridges through Denver were destroyed by floodwaters.



Jensen/Langbauer: Flood!



Jensen/Langbauer: Flood!

#7 Aerial view of damage at Hampden Avenue bridge at south city limits of Denver proper. Old span is shown lodged against left abutment of new bridge and part of new span is shown downstream in channel bed.

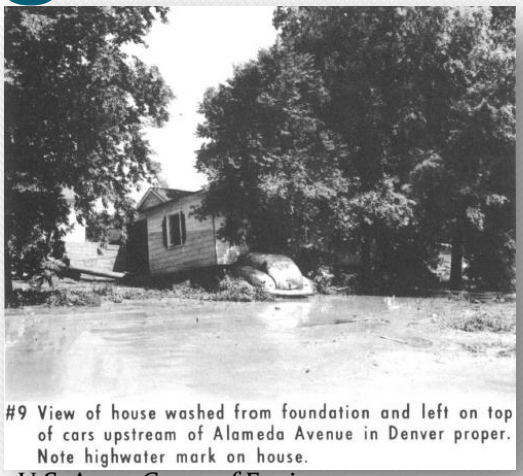
U.S. Army Corps of Engineers

Jensen/Langbauer: Flood!

Structural Damage

Jensen/Langbauer: Flood!

Across the state, 2,500 homes were either damaged or destroyed



#9 View of house washed from foundation and left on top of cars upstream of Alameda Avenue in Denver proper. Note highwater mark on house.

U.S. Army Corps of Engineers

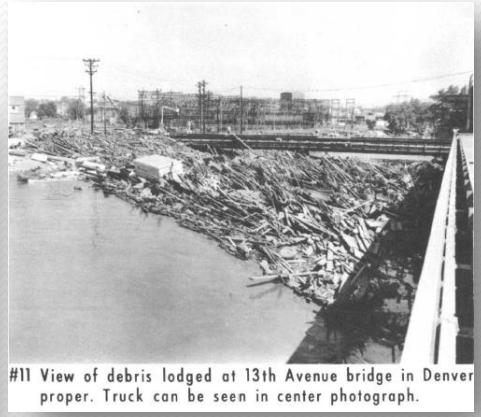
X-29247 Denver Public Library, Western History Collection

Jensen/Langbauer: Flood!

Debris Piles

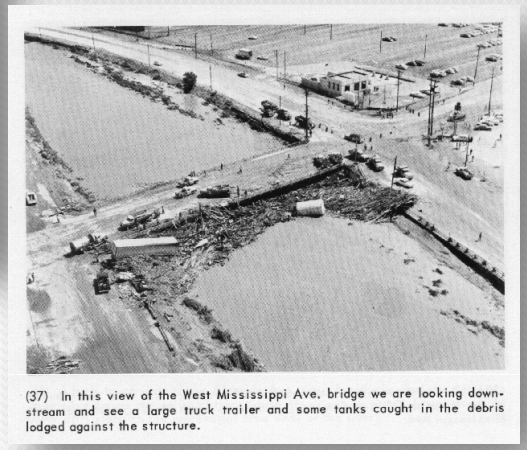
- Bridges were destroyed not because of poor quality, but because of pressure built up from debris.

Jensen/Langbauer: Flood!



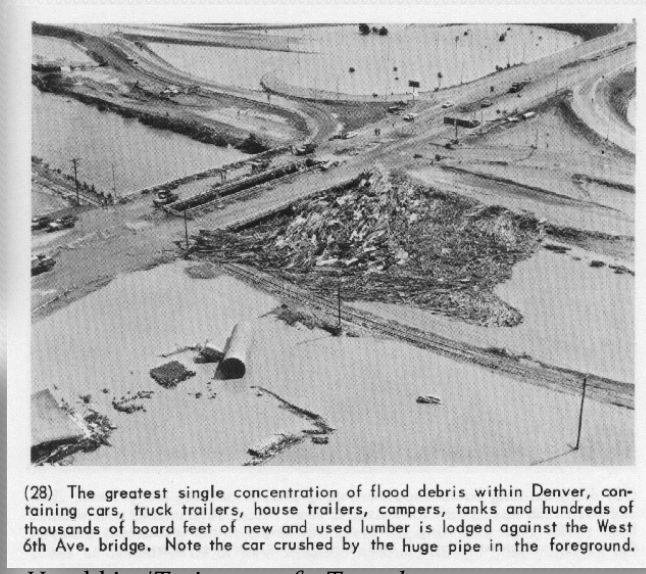
#11 View of debris lodged at 13th Avenue bridge in Denver proper. Truck can be seen in center photograph.

U.S. Army Corps of Engineers



(37) In this view of the West Mississippi Ave. bridge we are looking downstream and see a large truck trailer and some tanks caught in the debris lodged against the structure.

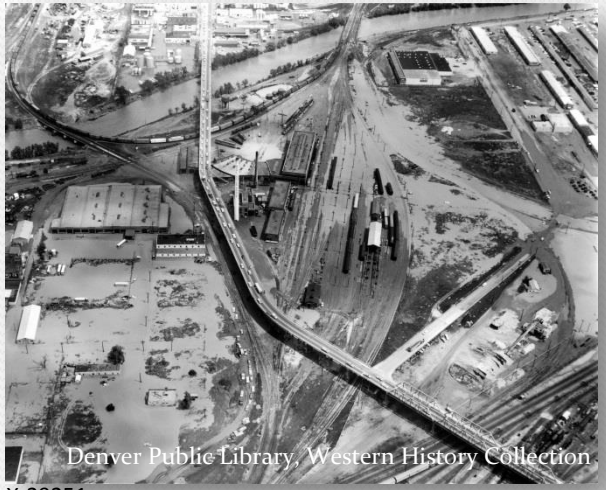
Hotchkiss/*Trajectory of a Tragedy*



(28) The greatest single concentration of flood debris within Denver, containing cars, truck trailers, house trailers, campers, tanks and hundreds of thousands of board feet of new and used lumber is lodged against the West 6th Ave. bridge. Note the car crushed by the huge pipe in the foreground.

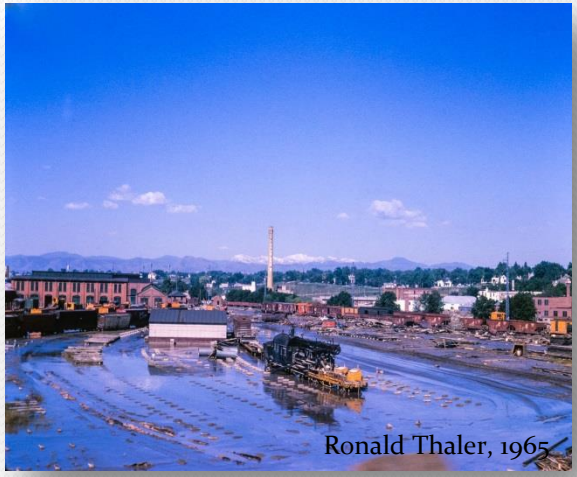
Hotchkiss/*Trajectory of a Tragedy*

Railways Inundated

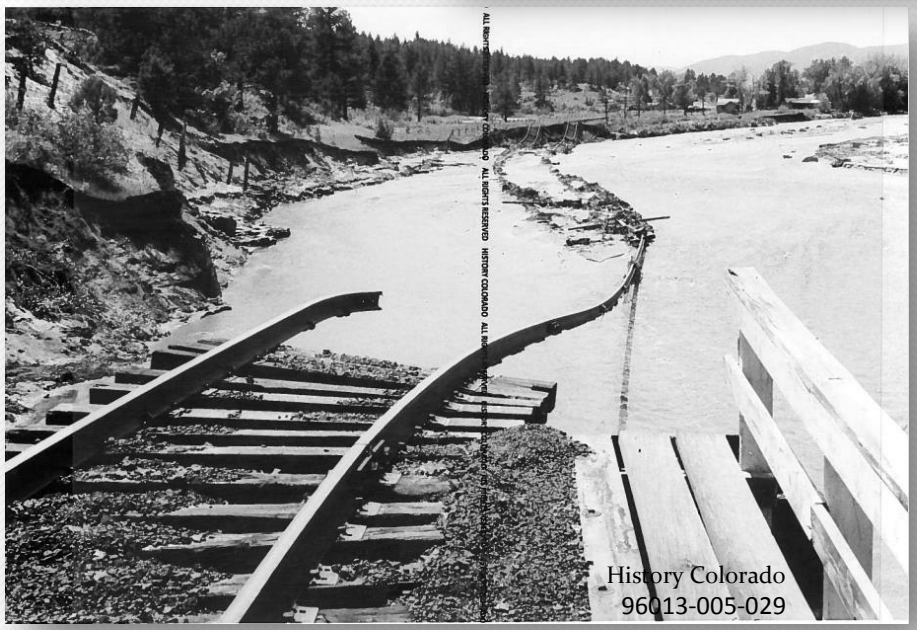


X-29251

- The rail yard in south Denver was completely flooded.
- 67% of flooding in Denver occurred in the industrial area.



Jensen/Langbauer: Flood!



Extent of the Floodwaters

1994.001.0007 Douglas County History Research Center
Douglas County Libraries

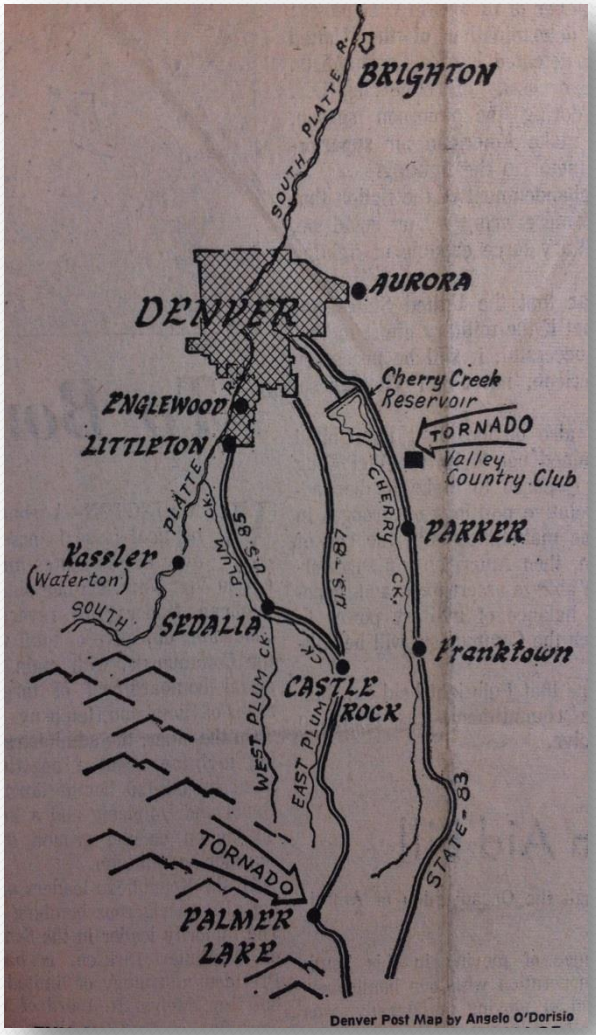
The South Platte became ½ mile wide.

The peak on the South Platte River was described as a wall of water 20' high.

X-29275 Denver Public Library, Western History Collection

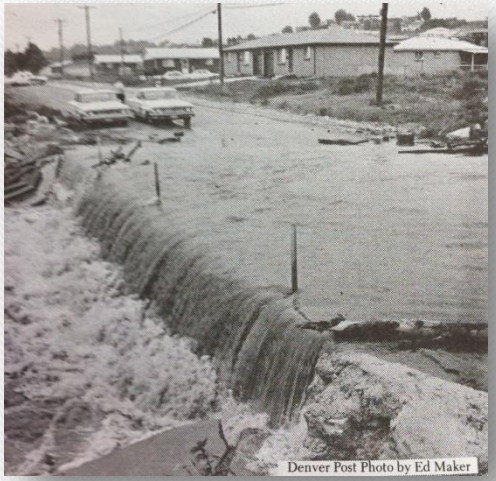
X-29278 Denver Public Library, Western History Collection

Flood Damage Cost



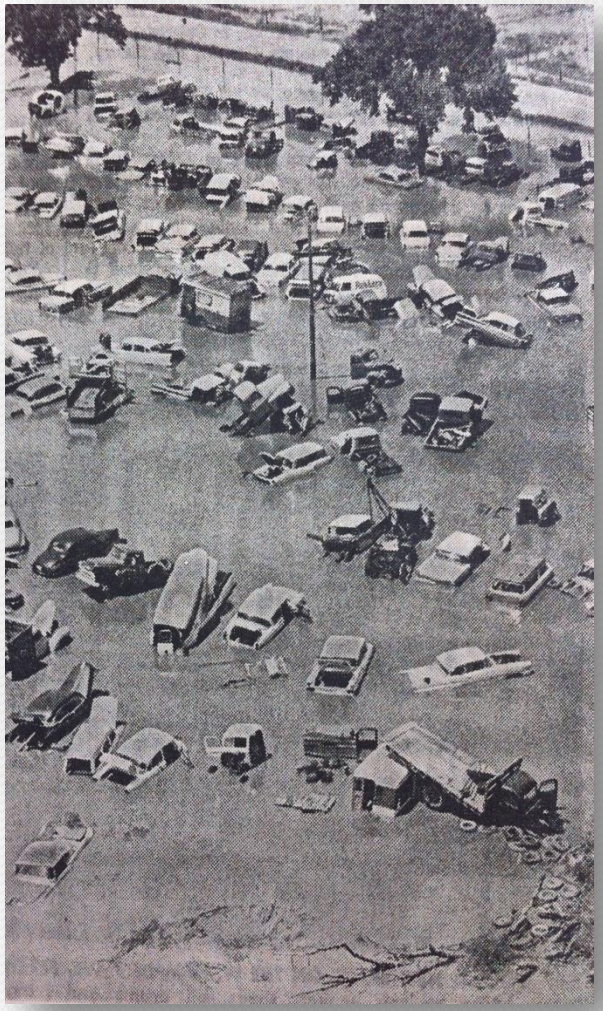
Denver Post
June 17, 1965

In the South Platte basin, damages totaled $508.2 million.



Jensen/Langbauer: Flood!

$300 million of this damage occurred in metropolitan Denver.

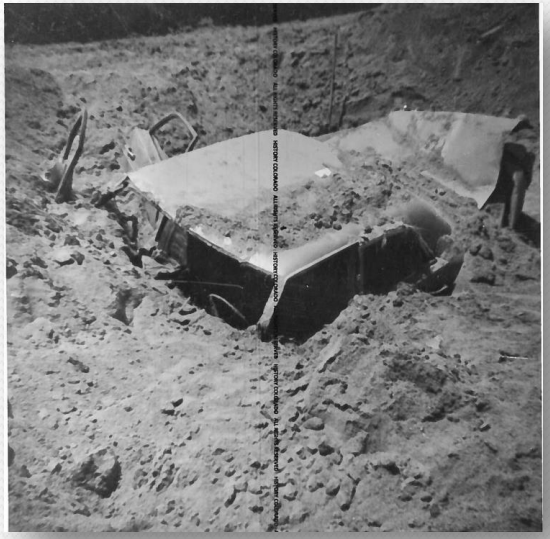


Denver Post
June 20, 1965

Fatalities

There were a total of 21 deaths attributed to the week's flooding.

Jensen/Langbauer: Flood!



History Colorado Museum
94001-29

Eight of these deaths occurred along the South Platte River; 6 were by drowning.

Cherry Creek Reservoir

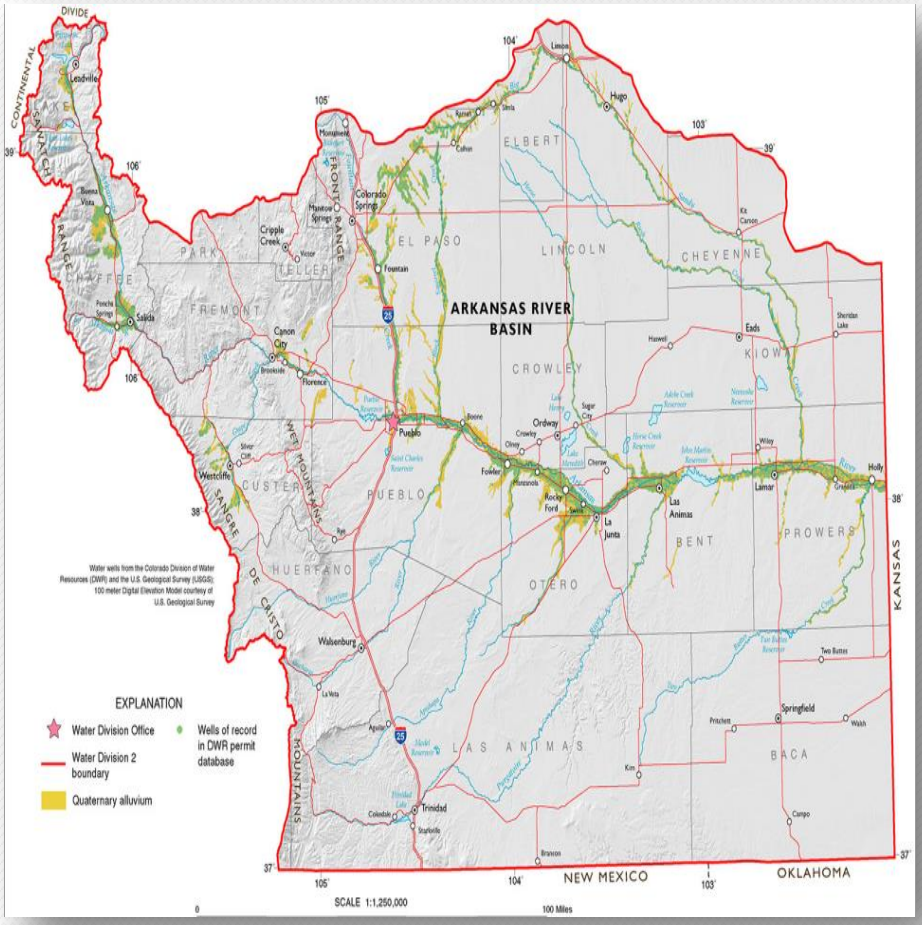
- All of the excess flow from Cherry Creek was stored in the Cherry Creek Reservoir.
- The building of this dam was controversial, but proved its worth during this flood.
- Damage in Denver would have been astronomically greater without it.

Chatfield Dam & Reservoir

- Construction began in 1967, as a direct result of the 1965 flood.
- The dam and reservoir were completed in 1975.
- Located south of Littleton, the inflow comes from Plum Creek and the South Platte River.

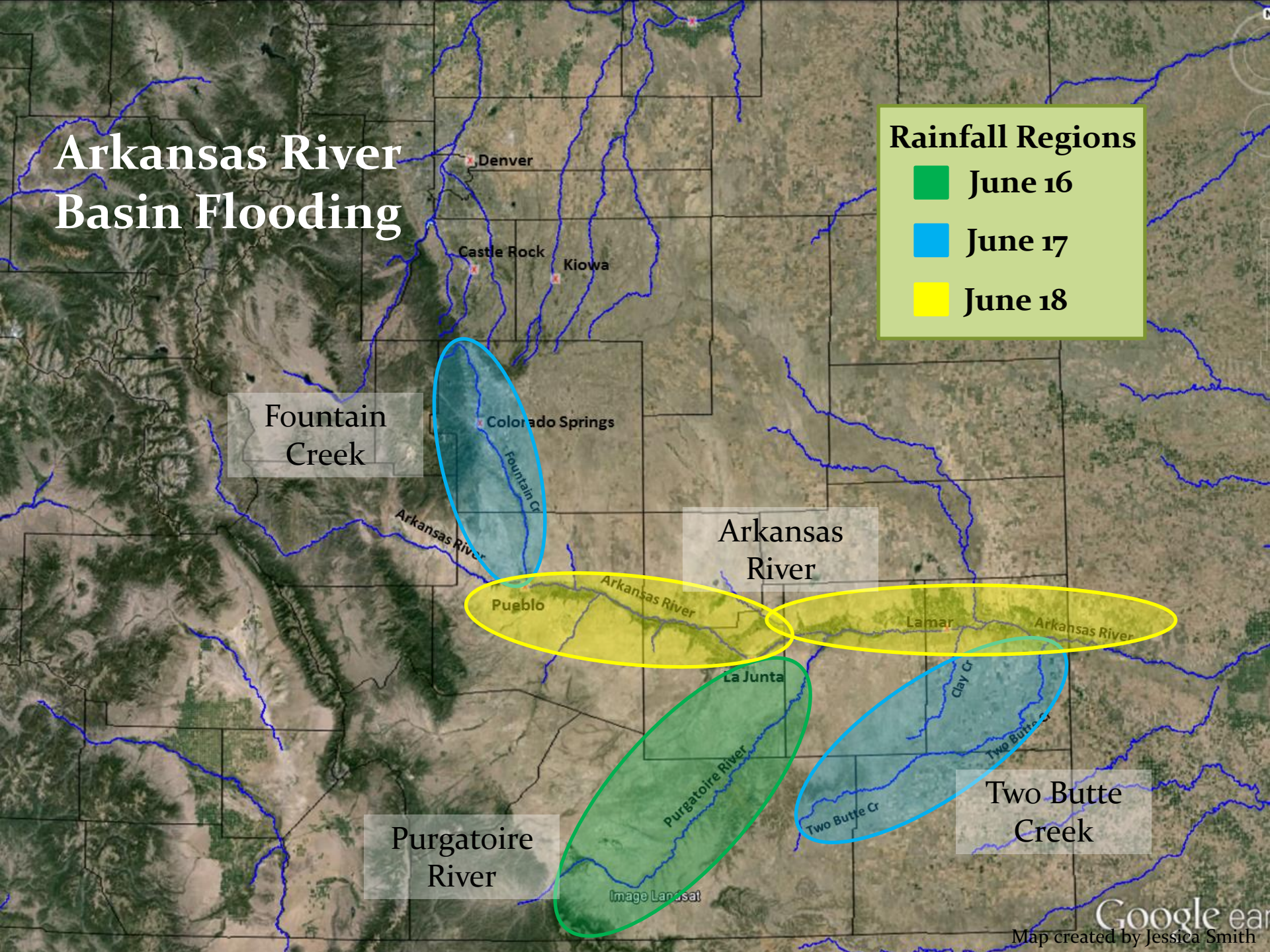
Flooding Locations

Arkansas River Basin



US Geological Survey

- Flooding occurred in 5 areas:
  - North of Pueblo
  - Purgatoire River
  - Arkansas River from Las Animas to the state line
  - Arkansas River from Pueblo to Great Bend, KS
  - Canadian River in New Mexico



Map created by Jessica Smith

June 1965 Flow Rates

Arkansas Basin

Location	June 1965 Peak Flow (cfs)
Fountain Creek near Pueblo	80,000
Purgatoire River at Trinidad	15,700
Two Butte Creek at Two Butte Reservoir	182,000*
Arkansas River at the John Martin Reservoir	104,000

Data from the UCAR Assessment

*This is the flow rate of Two Butte Creek after the flow had already overtopped the reservoir.

Photo Credits

- Jensen, Parley, ed. Comp. Harry Langbauer. *Flood! Colorado's Worst Catastrophe* 1966: *Denver Post*. Print.
- *Trajectory of a Tragedy: Denver Area Flood*. Publication. N.p.: Hotchkiss, 1965. Urban Drainage and Flood Control District. Web. 12 July 2013.
- U.S. Army Corps of Engineers. Omaha, Nebraska. *Report on the Floods of June 1965, South Platte River Basin, Colorado & Nebraska*. Omaha: Corps of Engineers, 1967. Print.